STATE OF MAINE

Guidance for Preventing and Managing Pests in Maine Medical Marijuana Cultivation

Maine Department of Agriculture, Conservation and Forestry
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This document describes practices for preventing and managing arthropods, rodents, plant pathogens and other pests using combinations of physical, mechanical, biological, cultural and chemical methods in an integrated pest management (IPM) program. The intent of this document is to provide science-based information to assist Maine growers of medical cannabis in following Best Management Practices approved by the Commissioner of the Maine Department of Agriculture, Conservation and Forestry. The goal is to guide growers in the production of an uncontaminated product while providing a safe workplace environment for workers.

Guidance for Preventing and Managing Pests in Maine Medical Marijuana Cultivation
This document is intended to provide guidance to growers of medical marijuana to support compliance with Maine's regulations and to assist growers in preventing and managing pest-associated losses while minimizing risks of product contamination. ***Note:*** *Throughout this document the term 'pest' refers to any living organism posing unacceptable levels of risk and includes but is not limited to insects, mites, plant pathogens, mold and mildew, weeds, birds, and animals. Furthermore, under Maine law, a pesticide is any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest and includes disinfectants, insecticides, herbicides, fungicides, plant regulators, defoliants and plant desiccants.*

1. Design and maintain facilities to prevent introduction and spread of pests.

- Equip enclosed cultivation and processing operations with adequate ventilation, lighting and temperature controls to maintain optimal conditions for good plant growth while discouraging pests and plant disease.
- If a mechanically propelled air intake system is used, a filter capable of removing 99.97% of particles with a diameter of 0.3 micrometers (µm) should also be utilized, as necessary to control potential contamination with plant pathogenic organisms. If a non-mechanically propelled or passive intake system is being utilized, a well-sealed grate and filter sufficient to reduce the intrusion of rodents, mites, and insects should be installed.
- Create positive airflow to direct air out of growing spaces, not into them.
- Screen openings where possible. Seal all cracks and crevices to prevent entry by insects, mites, birds, rodents, or other animals. Seal all gaps around exterior doors with weather stripping, door sweeps, and/or properly adjusted thresholds.
- Maintain weed-free zone around buildings and greenhouses.
- Design facilities to provide good moisture control and drainage. Keep floors, cultivation surfaces, and other surfaces clean and dry. Eliminate standing water. Disinfect and repair irrigation systems.
- Design growing spaces to allow them to be periodically emptied and thoroughly cleaned and disinfected between crops.
- If growing in pots, install tables or benches made of material that allows air flow and which can be cleaned and disinfected, such as wire or mesh, to support pots above the floor.
- Cover floors with material that can be cleaned and disinfected, permits drainage, and suppresses weed and algae growth.
- If growing in pots, install benches or other supports made of wire or mesh to encourage good air movement to discourage plant pathogens.

2. **Establish and utilize sanitation protocols to prevent the introduction and spread of arthropod pests and pathogens within the facility.**

- Place disinfectant mats at entrance to each room.
- Do not allow smoking in the facility.
- Provide facilities for workers to change into clean clothing before entering facility and to shower and change clothing at the end of their work day. Provide hair nets, hats,

beard covers, or other effective hair restraints to workers to reduce risk of pests being transported into and within the facility.

- Train workers in all appropriate biosafety protocols such as inspecting and brushing off clothing, disinfecting shoes and tools, and washing hands before entering or moving between each growing room. Train workers to start in the cleanest, most pest-free spaces first, progressing to infested or less protected rooms while working and avoid moving from infested areas into uninfested areas.
- Inspect any new plant material or equipment upon arrival to the facility after working in an infested section. Keep newly introduced plant material quarantined in a separate room for a period of time to ensure it is pest-free before moving it into a growing room.
- Sterilize propagation tools before each cut by dipping them in disinfectant solution and rinsing with sterile water.
- Remove any diseased foliage or plants from greenhouse promptly. Seal it in a plastic bag to prevent spreading disease inoculum while carrying it out and dispose in sealed container outside of the facility.
- Keep hose nozzles off the floor.
- Disinfect all surfaces using a disinfectant labeled and registered for this use. Use disinfectants only in accordance with label requirements. (Note: all disinfectants are classified as pesticides).
- Avoid reusing growing media. Heat-sterilize any media that has been open or exposed to microbes or other pests. Keep growing media in sterile, sealed containers until used.
- Disinfect pots or other containers before use.
- Keep facilities free of weeds, plant debris, pest harborage, mold, mildew and algae.

3. **Provide optimal growing conditions to promote healthy plant growth, encourage natural enemies and minimize pest-conducive conditions.**

- Operate ventilation, heating/cooling and lighting systems to keep humidity, light and temperatures at optimal levels that support plant growth and natural enemies while discouraging pests. For pre-flowering plants, maintaining relative humidity at 50% or less reduces risk of plant diseases and spider mites while encouraging spider mite predators. Ventilate to minimize condensation and encourage air exchange, at sunset if possible.
- Select pest-tolerant and disease-resistant cultivars if available.
- Use tools, such as foliage or soil analysis, to determine an appropriate nutrient program. Use EC meter to formulate and test nutrient solutions. Use EC readings or the “pour through” method to monitor salt levels in the growing medium.
- Test water source for presence of carbonates and other minerals that can interfere with maintaining proper pH.
- Maintain optimal moisture level in growing medium. Overwatering promotes insect pests and plant disease. Inspect and maintain irrigation equipment to ensure optimal delivery of water and nutrients. Water at the base of the plant, not over the top of the plant, taking care to avoid splashing and wetting foliage.

- Avoid applications of liquids directly on plants, especially carbohydrate-based products such as molasses-based fertilizers, flavorings, leaf washes, leaf shines, and other products that can promote mold and mildew and adulterate the crop.
- Provide adequate spacing around each plant to prevent them from touching one another to prevent pest movement among plants and to allow adequate air circulation. Prune foliage if needed to allow good air movement among plants and to prevent plants from touching one another.

4. Implement effective procedures to regularly and systematically monitor for pests.

- Develop pest-monitoring program for each section of each facility.
- Train employees in all pest prevention, detection, identification, monitoring and record-keeping protocols.
- Scout plants at least weekly for insect, weed, and disease problems, using a designated employee. Each time, examine about 5 plants in each of 5-10 locations throughout the greenhouse to look for evidence of pests, off-color foliage, irregular growth or other symptoms.
- Monitor insects with sticky cards, check cards weekly and change when needed.
- Identify unknown insect and disease problems. Maintain scouting records to track and predict pest problems.

5. **Develop and utilize an integrated pest management plan that includes least-risk protocols for preventing and managing common pests.**

- Consider biological methods (such as the use of beneficial organisms), cultural methods (such as controlling temperature and humidity to avoid and control pests), mechanical methods (such as pest traps, pruning, or hand removal of pests). If using natural enemies, purchase from reputable source, and release them using recommended rates, intervals and procedures.
- Pesticides* should be used only in conjunction with non-chemical methods, when non-chemical methods have failed to keep pests below acceptable levels, and only used when and where needed. Use insecticides only against those pests for which effective natural enemies are not available. Ensure any pesticides used are compatible with natural enemies.
- Avoid the use of pesticides* on flowering plants. Avoid the use of any liquids on late flowering plants to avoid mold and mildew contamination of product.
- Use appropriate methods for weed control. Mow, burn, or hand-pull vegetation or install landscape fabric to keep vegetation 1-2’ away from building exteriors. Indoors, hand-pull weeds or install weed barrier material.
- Ensure that any pesticides applied are permitted by state and federal regulations and are used only in strict accordance with the product label.

6. Keep detailed and organized records.

- Cultivation operations must provide the following records to the appropriate Maine state regulatory bodies, other cultivation operations, processing operations, manufacturing operations, and dispensing operations receiving cannabis from the cultivation operation, upon the receiving operation's request:
    a. Nutrients used during cultivation;
    b. All substances applied to the plant(s) surface or used as a fumigant in the cultivation area;
    c. Other substances used during cultivation that may result in a residue on cannabis.
    d. Pesticides applied during cultivation. Pesticide use records must be kept according to Chapter 50 of Maine Board of Pesticides Control regulation. This information can be found at http://www.maine.gov/dacf/php/pesticides/laws.shtml
- Record all cultivation processes used including nutrient records, seed and clone sources, insect and disease monitoring records, pesticide application records, disinfectant records, watering records, type and source of growth media used, types, sizes and sources of pots and other growth containers,.
    - Include fertilizers used (rates, nutrient analysis, product name, method of application);
    - Environmental conditions (temperature, humidity and lighting regimes)
    - growing media;
    - Biological controls used (species, sources, release dates, numbers released, release methods);
    - Pesticide applications (product label, rate, amount applied, method of application, precise description of where applied).

7. Use, store and dispose of pesticides only in accordance with state and federal regulations including the following:

- Pesticides may only be used in strict accordance with the product label requirements including, but not limited to directions pertaining to application, storage and disposal of the pesticide product.
- Pesticide products must be registered with, and not prohibited for the intended usage by, the Maine Department of Agriculture, Conservation and Forestry Board of Pesticides Control pursuant to Title 7, section 607, and must be used in a manner consistent with these Best Management Practices approved by the Commissioner of Agriculture, Conservation and Forestry.
- Application of nutrients or pesticides through an irrigation system (chemigation), must be performed in accordance with state or local agricultural regulations.
- Home-made pest control substances (including food-based solutions) are not allowed.
- When using a pesticide, ensure that the primary caregiver or the registered primary caregiver's employee is certified in the application of the pesticide pursuant to section 1471-D.
- Ensure that any employee who has direct contact with treated plants has completed safety training pursuant to 40 Code of Federal Regulations, Section 170.130.

- Ensure that an employee of the registered caregiver who is not certified pursuant to section 1471-D and who is involved in the application of the pesticide or handling of the pesticide or equipment must first complete safety training described in 40 Code of Federal Regulations, Section 170.230.
- Pesticide storage, mixing and use must be in compliance with Worker protection Standards and must meet product label requirements for fire and chemical safety. Ensure all necessary personal protective equipment is available, clean, and properly stored.
- Ensure pesticide application equipment is properly calibrated.

References

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